

## **CRANE WINS GOVERNOR'S AWARD FOR ENVIRONMENTAL EXCELLENCE**

On September 27, 2002, Crane Army Ammunition Activity (CAAA) was rewarded for its ongoing recycling efforts with the highly competitive Indiana Governor's Award for Environmental Excellence. Stan Armstrong, CAAA Civilian Executive Assistant, accepted the award from Governor Frank O'Bannon and Indiana Department of Environmental Management (IDEM) Commissioner Lori F. Kaplan. Crane was one of only eighteen Indiana facilities to receive an award. A review committee of representatives from industry, government, academia, and environmental groups selected the winners in six different categories: energy/renewable resource, greening the government, land use, outreach or education, pollution prevention/source reduction, and recycling/reuse.

Crane Army Ammunition Activity received an award in the Recycling/Reuse category. The two projects singled out by IDEM included recycling of 886,904 pounds of material with cost savings of over \$655,000 from Crane's demilitarization program. The first project involved reuse of red phosphorus candles from Marine Location Markers to produce a different type of marker. The second project recovered sodium nitrate from document destroyers slated for disposal. Teams of engineers, planners, technicians and production workers developed these projects. Further descriptions of the projects are outlined below.

### **Reutilization of Mk 25 Mod 4 Marine Location Markers**

At CAAA, over 27,000 Marine Location Markers (MLMs) failed lot acceptance. These MLMs contain a red phosphorus composition and require disposal by costly incineration. To avoid the disposal cost and to meet a need for MLMs the project team found a way to break down the old markers and reuse many of the parts, including the "candles" which contain about one pound of red phosphorus.

Because of the limited disposal options and the value of red phosphorus there is always a need to find ways that will allow for the reclamation and reuse of red phosphorus in both commercial and military applications in a cost effective manner. The project team took the initiative to avoid the costly incineration disposal process. They determined that with some modifications the old components could be used in new MLMs. They obtained approval from the Operations Support Command to carry out this work. In order to actually implement the rework, they developed new procedures to safely disassemble the rejected units and rework the "candle assembly", which contains the red phosphorus composition. These new procedures had to be prepared by the project team and approved by the CAAA organization. The candle assembly presented new safety concerns since it contained the highly reactive starter and match components. However the project team designed and implemented controls to minimize any hazards to the operators. Once the usable portion of the candle was prepared for reuse, the new MLMs were reassembled. Workers also had to proceed carefully during this phase because of deformation of the candles from long storage. This deformation made fitting the candle into the inner tube of the MLM difficult.

The candles inside the markers contained red phosphorus and would be considered hazardous waste if no further use for the candles could be found. Since each candle contained about one pound of red phosphorus, approximately 27,654 pounds of red phosphorus would be re-used.

Without any action the markers would have to be disposed by incineration at a total cost of \$655,000. As a result of reusing the components and avoiding the cost of disposal, the savings amounted to \$655,000.

#### Resource Recovery and Recycling Process for Document Destroyers

In 1999, the Army declared that 5,400 Document Destroyers were surplus to DoD needs, and Crane Army Ammunition Activity received authorization to demilitarize these units. The demilitarization instructions for these units required open burning of the Document Destroyers as a whole unit. The Document Destroyers contain explosive components along with 175 pounds of sodium nitrate to fuel the unit. In accordance with established procedures, open burning of these units commenced in late 2000.

After a minor incident involving these units in December 2000, Crane formed a team to look at alternate methods of demilitarization of these units. The team developed a safe disassembly process in which the sodium nitrate could be removed from the units without subjecting the material to explosive contamination. This Resource Recovery and Recycling (R3) process was approved for use and incorporated into the Standard Operating Procedure and Demilitarization instructions for the Document Destroyers. Since the change in operating procedures, CAAA personnel have disassembled 4,910 Document Destroyers. The sodium nitrate has been collected and efforts are underway to sell this material through the Defense Marketing and Reutilization Office at Crane.

Prior to the changes incorporated by CAAA personnel, Demilitarization instructions required open burning of the Document Destroyers. The CAAA team, after careful research and consultation with explosive safety personnel, recognized that the disassembly process was applicable to these units. Although the instructions called for open burning, the CAAA team requested for a deviation from these instructions in order to recycle the sodium nitrate. The team developed new procedures for disassembly of the units and received approval for implementation of the procedures. This innovative process removes the unit's explosive components for disposal by open burning, and provides for the removal of the sodium nitrate for recycling.

The new process has been applied to 4,910 units during May 2001 to Feb 2002. This has enabled the recovery of 175 pounds of sodium nitrate per unit or 859,250 pounds of sodium nitrate total. The new process achieved a 95% diversion rate by unit weight. The recovered material has been placed into storage and will be offered for sale through the Defense Reutilization and Marketing Office. This effort diverted 859,250 pounds of material from open burning and any of the resultant emissions that would have been derived from burning of the sodium nitrate.

The Indiana Department of Environmental Management noted CAAA for its on-going recycling efforts to reduce pollution generated from demilitarization activities. This success is due to Crane's long-term program to develop demilitarization alternatives that look for ways to reduce pollution, recycle, and re-use materials without sacrificing operator safety. These initiatives have helped Crane become a recognized steward of the environment, but there is still work to be done. Crane Army Ammunition Activity will continue to aggressively pursue efforts to reduce pollution. Crane will build on its past successes and use them for blueprints for future initiatives.

With the help of creative employees like the ones involved with the above projects, Crane's environmental success should continue well into the future.